



# Institute of Demolition Engineers

## Foundation Degree Course – Demolition Management

### MODULES

#### MODULE 1: A. RESEARCH METHODS

This module will explore the various types of primary research methods that students need to be familiar with to reach the required standard and complete the external coursework to a satisfactory level.

This module will also introduce different software which may help form the assignments that are expected to be submitted, along with the course's rules, the pass marks, and the acceptable standards.

#### Objectives

By the end of the session, the learner should:

- Understand the different types of research methods used in the academic environment.
- Be able to set up and deliver an academic submission to the correct standard.
- Understand the importance of critical writing.
- Be able to reference the documents using the Harvard reference style correctly.

#### Class Exercise

There is no class exercise attached to this module, although class discussion and questioning will be encouraged.

#### External Coursework

There is no external course work attached to this module, although the learning aims will impact and influence all the assignments for the entire degree.

#### MODULE 1: B. UNDERSTANDING THE UK DEMOLITION SECTOR AND RESEARCH METHODS

This module starts with the demolition sector's history and explores what influences demolition operations, including the institutions, trade bodies, codes of practice, and guidance.

The module covers the current GDP of the construction industry and how the demolition sector takes a share of the market together with staffing and practitioner levels and helps to identify the strengths, weaknesses of the industry along with the opportunities and threats available within the sector

#### Objectives

By the end of the session, the learner should:

- Understand the history of the demolition sector.
- Understand the factors which directly influence the industry as a whole.
- Be able to identify the strengths and weaknesses of the demolition sector.

#### Class Exercise

There is no class exercise attached to this module, although the in-class debate will be encouraged and expected

#### External Coursework

Produce a technical SWOT analysis report of a minimum of 3000 words giving your views on the state of the demolition sector, the issues of the day, and the direction you see the sector heading or being forced to work towards?

## **Module 2: a. Occupational health & safety**

### **b. CDM Regulations**

The first part of this module is devised to give the student a basic understanding of how workplace accident, incident and ill health data is reported and collated. It seeks to encourage the student to question the status quo and the principles of that data collection process and what it actually means to the practitioner, employer and enforcing authorities.

The second part of the module covers the CDM regulations and examines the duty holder roles, the purpose of the regulations and the significant topics for consideration by demolition practitioners, embedded within.

#### Class Exercise: Part 2a only

The students will interrogate the information learned in this session regarding data collection and shall be required to set out (in a recognised easily read format) how they consider that accident/incident/ill health data can be better collected to provide increased accuracy, in sensible time frames

#### External Course Work

The construction industry is the largest employer in the UK labour market employing around 1.2M people with a GB GDP of £27,109.00 Million (1<sup>st</sup> quarter 2018). Safety in the workplace has been the subject of many reports and strategies for improvement over the years which statistics suggest have been made. There are many differing trades and disciplines involved in the construction process, some that can be said to be high risk and others that are a low or medium risk. All work undertaken within the industry is conducted within a regulatory framework consisting of around 20 workplace regulations addressing occupational health, safety and welfare and safe plant and equipment at their heart. Atop all these regulations sit a number of acts as well as European Directives. HSE and Industry have also produced codes of practice, guidance and information leaflets covering a multitude of topics.

*Produce a technical report of a minimum 3000 words and a maximum of 4000 words giving your view on how UK Legislation (Acts & Regulations) influences the thoughts and actions of organisations involved in the construction industry and what if any these factors benefit, or if you believe is the case, are a detriment or barrier to the demolition sector. What would your recommendations be?*

## **MODULE 3: ASBESTOS IN THE BUILT ENVIRONMENT**

In this teaching module, the student will learn of the health risks and the hazardous properties associated with all types of asbestos. Particular attention is paid to the identification of asbestos, where it can be most easily located, its uses and the legislation governing its removal, handling and disposal.

Practitioners within the demolition sector make up the largest contingent of individuals and organisations removing and disposing of this material.

#### Objectives

By the end of the session, the learner should:

- Understand the different types and classifications of fibrous asbestos.
- Explain why asbestos was so widely used internationally.
- Understand health impacts.

- Identify where the most likely places to find asbestos are.

Class Exercise:

There is no class exercise attached to this module, although class discussion and questioning will be encouraged.

External Course Work

The United Kingdom, in the 20<sup>th</sup> century, imported in excess of 6 million tons of raw asbestos fibre. This naturally occurring mineral was embedded into over 3,000 products that in turn was placed in our homes, workplaces, hospitals, schools, public buildings and transport etc. The use of asbestos was so prolific that it was known as the 'magic mineral' because of its qualities. How times have changed, it is now known as the 'tragic mineral' because of its proclivity to kill.

*Using what you have learnt in the previous modules produce a report of not less than 3000 words covering the health and safety impacts of asbestos and how if at all the legislations helped to control the health impacts.*

**Module 4: Asbestos for management**

On completion of this module all students should have a working knowledge of how to manage an asbestos removal process irrespective of whether an individual works for an asbestos removal contractor or otherwise. Knowledge of what legislation and best practice declare to be necessary to maintain safety at work, safety for the general public and stay within the law are paramount to ensuring that all risks have been considered and the requisite control measures applied to manage them. In addition, this module will identify all relevant plant, tools and equipment used within the asbestos removal process.

Class Exercise:

Students will be set a number of tasks throughout the presentational slides as a review and learning process. All students are encouraged to bring to class copies of all relevant guidance related to asbestos removal. *A reading list will be available for all candidates to peruse*

External Course Work

The public perception of the risks posed by asbestos is well below that which should be expected. This is a worrying factor as it can be shown that the greatest threat of exposure to asbestos fibres is to peripatetic trades such as plumbers, electricians and carpenters who are at risk of disturbing the material during normal work activities. It is vitally important that those tasked with removing this killer material understand the legal requirements and control measures needed to manage this process.

*Produce two (2) Plans of Work that describe fully all procedures and processes to manage the removal and disposal of asbestos from these two scenarios;*

1. *4 linear metres of lagged pipework, 12 m<sup>2</sup> of AIB ceiling panels, 2m<sup>2</sup> of fire door panel and AC gaskets to pipe joints within a small boiler house of 5m x 4m x 2.5m area. The access point is through a single door into a covered courtyard*
2. *500m<sup>2</sup> of AC roofing sheets within a vacant industrial warehouse. Access is via a wide and high set of double doors leading out onto the warehouse forecourt.*

The student should use illustrations (sketches, drawings etc) to aid in the text explanation of the removal process

## **Module 5: Demolition and the environment**

The fundamentals of good environmental management are to be found within this teaching module. The students will be appraised of Pollution Control, Waste Management, Statutory Nuisance, Environmental Management, Enforcement and Sustainable Development practised within a demolition workplace.

### Class Exercise:

A typical demolition site (domestic, commercial, industrial) will contain numerous products and materials. Group and list those typical into the types of 'waste' streams giving your opinion on disposal routes being mindful of health, safety and environmental legislation/concerns that are either a driver or barrier to the management of such?

### External Course Work

Never before, in past years, has such scrutiny been given to what and how the demolition sector manages their environmental responsibilities. When one considers that a typical demolition contractor will manage, handle and dispose of thousands of different products and materials arising from their normal daily work processes, its small wonder that this is a little known or understood fact by non-practitioners. Environmental regulation in the UK is a minefield to be negotiated and this not made any easier by the application of the European Directives, in addition. Permitting and 'end of life' solutions are critical factors to be considered to avoid enforcement.

*Produce an Environmental Management Plan for the following (hypothetical) demolition project;*

#### ***A seven storey residential block located in the centre of a large urban housing estate.***

*The construction of the block is of poured insitu floor slabs, pre-cast concrete panels forming internal walls and external brickwork cladding. Lift shafts, stairwells and cross walls form the shear walls. Single storey garages, at ground level, are attached to one elevation and are to be demolished along with the block. However, the access road along this elevation is to remain open to other residents parking adjacent. A children's play area is located close to the north gable, shops and a community hall are near to the south elevation of which all have to remain 'live' and usable throughout. The access roadway to the block is a busy thoroughfare and cannot be blocked or suspended from use. The block is surrounded by public footpaths and grassed areas which the local community use frequently.*

Your EMP should be at least 3,000 words and take into consideration all of these points together with the approach to recycling/reclamation/re-use targets, traffic management, public safety, the local environment and all legislative/key considerations. *A further detailed narrative will be given to students as a hand out.*

## **Module 6: Demolition Methodology**

This module will examine the various methods or designs of work practices and will encourage the student to discuss those options given site constraints and other issues that may dictate policy. In addition, competency and good practice are highlighted together with the views and opinions of non-practitioners towards demolition methodology.

### Class Exercise:

Students will be required to comment on and discuss the methodology, plant, equipment and logistics of up to a dozen different types of structures. This exercise will be a 'wipe board' and or 'flip chart' activity led by the tutor but performed by the class members.

### External Course Work

This and previous modules have touched on public perception as well as the lack of knowledge, displayed by clients and consultants alike, towards how and why demolition practitioners formulate and execute their methods of work. Academic Institutions looking towards Sustainability, on all fronts, seek evidence based methodology and justification and whilst this may appear alarming, may be little more than postulating to create forum for better understanding.

*Produce a method statement of at least 3,000 words for the reduction of a commercial/retail building. The narrative and detail of the subject will be given to all students in the form of a hand out at the end of the teaching session*

### **Module 7: Demolition Plant and Equipment**

This module will examine and discuss the types of plant and equipment used in today's demolition environment. Future innovations in technology advances for all such plant and equipment will be included.

Video footage of demolition plant in action will accompany this module.

### Class Exercise:

There is no class exercise with this module

### External Course Work

The demolition world, in terms of machinery use, has moved along at a ferocious pace in a relatively short time period. The UK only saw the use of 'super high demolition machines' towards the end of the 1990's. Excavators came into full use in the 1980's whilst the lattice crane and ball dominated the demolition process well into the 1980's before it became unfashionable and largely redundant. Lorry mounted access equipment was first introduced in the 1970's but didn't really take off in its present utilisation until the 1990's. Go back to the 1970's and beyond, particularly for many domestic demolition projects, hand working was the most prevalent mode of operation.

*Through your own unique experience or via research methods, produce a potted history (at least 3,000 words) of the use of machinery (plant & equipment) to undertake all types of demolition in the UK. Your report should examine and discuss machinery usage from the Second World War years through to present day with comments on your thoughts for future innovations and use.*

### **Module 8: Oxy-propane Cutting Equipment**

This module will inform, explore and evaluate all aspects of the use of 'hot' cutting techniques, the individual items of equipment, the cylinder design and qualities, the gases and hazardous nature as well as the safety considerations and controls.

#### Class Exercise:

Using 'flip' chart and or 'wipe board' identify all gases that may be in use on a site, what their properties are, their safe use controls and their limitations of use. Create a site sketch identifying locations of use and safety control locations.

#### External Course Work

With the advent of the coming of large demolition machines and their attachments, i.e. shears and grapples etc. the use of oxy-propane cutting as a fundamental process of cutting and processing scrap metals has become less common and in some projects non-existent. However, heavy gauge steels still require 'hot' cutting and this is very likely to continue for many years yet. Whilst the 'art' of cutting scrap metals is gradually being lost, it will still fall to specialists within the workforce to take up the mantle and continue the process.

*Using your own unique experience and or via research methods produce a report of at least 3,000 words identifying and describing the equipment, the processes for use, the qualities, advantages and disadvantages of the 'hot' cutting methods available to a demolition contractor in the present day. To do your report justice and to examine these processes fully, one should investigate the use of this cutting medium over an extended period of time to highlight the changing work practices through technology, innovation or to satisfy health, safety and welfare concerns.*

#### **Module 9: Structural Appreciation (part 1)**

This module will set the scene by first exploring, for example, what can go wrong if the structure being dealt with is not appreciated properly and the implications of this point.

The different types of loads will be considered (dead, live and lateral) with an explanation on how to easily estimate building and other loads, including elementary calculations.

Slenderness, restraint, load path and transfer will be introduced.

Different types of structure will be considered together with safety factors in design.

Some basic building types will be examined to look at load paths and the important aspect of stability, which will be considered in more detail.

Different, commonly used structural materials will be reviewed together with movement and jointing, with basic capacity calculations and associated factors of safety.

#### Class Exercise:

This will include looking at types of load and estimating their magnitude of loads. Examples of structural elements and consideration of slenderness and stability, basic assessments on member strengths and capacities will be worked through.

#### External Course Work

It is obvious that there are many different building designs, using common types of building products and materials, within that build process. Although how they are utilised may also greatly differ. There are subsequently disadvantages as well as advantages of the various materials in use. These

differences may have a bearing on how demolition methodology is approached to ensure safety and stability.

*Based on the information you will receive and the knowledge gained from this teaching module, Produce a technical report between 3,000 and 4,000 words that could be utilised to form a guide for those considering demolition of buildings, with particular reference to loading and stability. (Tutor guidance will be essential for this task)*

## **Module 10: Structural Appreciation (part 2)**

Following a brief recap of Module 9, this Module will initially look at simple typical forms of construction, loads and load paths using actual examples. More advanced structural forms will also be considered.

There will be an introduction to Building Information Models (BIM) and Demolition Information Models (DIM).

There will be a more detailed assessment of loading on a building.

Temporary Works including relevant procedures will be summarised. The structural aspects of pre-start checks will then be reviewed.

There will then be a number of case studies to learn from previous 'problem' jobs.

### Class Exercise:

Students will be introduced to 'hands on' working with drawings, detailed loading and load path assessments.

The class will look in a practical way at how the demolition of more complex buildings might be approached, with particular reference to stability.

Typical pre-start checks will also be prepared.

### External Course Work

Simple demolition projects are becoming as rare as hens teeth as the traditional build structures of yesteryear gradually diminish in number. Instead, they have been replaced with evermore complex and higher structures whose designs challenge even the most adept and experienced demolition teams. These structures necessitate new approaches to demolition engineering that often require input from other disciplines such as structural and civil engineers to better understand load paths and stability issues that may arise during the execution of the project. Demolition engineers too need to embrace change may necessitate a better understanding of how structures react.

*From the students own experience, using a historical and modern building or structure as two examples, choose 2 different types of building and run through all the procedures for a pre-start check for each (1500 words total).*

*Then, choosing one of the structures, summarise considerations using the outline route map in BS 6187 (1250 words).*

*Finally, giving 3 examples, consider the most common causes of problems in the demolition process that may be due to a poor appreciation of structures, with simple examples (1250 words).*

## **Module 11: Fundamentals of Commercial Management**

This module aims to give the student the knowledge of fundamental commercial management and the role of the commercial manager. The principles and types of contracts, how they are applied and how common law impacts on the interpretation of contractual obligations. Claims and how to pursue them as well as the options for dispute resolution will be examined.

Class Exercise:

There is no class exercise attached to this module

External Course Work

It is a very rare occurrence, in today's contractual atmosphere that a contractor is not required to agree too and sign up to some form of contractual obligation prior to being awarded work. The best informed contractor and or project teams will inevitably steer an easier route through the contractual minefield that is prevalent today. Being aware, rather than contractually weak, gives the practitioner an edge if one can understand the rudiments of a contract and the procurement route and what could go wrong as well as how to find resolutions to problems.

*From the information and tutoring given within this module, produce a technical report of no less than 3,000 words on the role of the commercial manager whose responsibility is to manage the tender, costings, pre-let, award, valuations and final account of a typical inner city demolition project. (for clarity, one should assume that the value of the demolition contract is circa £1M)*

**Module 12: Standards and Ethics**

In this final module the student will be informed to recognise the role that standards and an ethical approach to business play in ensuring a fair and honourable outcome. In addition to the regulations that are in place discussions will also centre on, honesty, morality, accountability, integrity, trustworthiness and many other traits that are needed. The module will also address conflicts of interest, responsible contracting and tendering and the avoidance of conflicts etc.

Class Exercise:

A member of the public and a doctor are faced with a life threatening situation both will each experience a different set of ethical, moral and professional standards with differing consequences. Explain in a scenario what these are?

External Course Work

Keeping ones head above water, so to speak, in business is a tricky affair at the best of times but when faced with a client or a supplier whose character is questionable, it makes the whole process fraught with uncertainties. Working with and dealing with people and organisations in an ethical manner and applying strict standards of conduct should be the fundamental and only approach taken by all parties.

In two parts;

- a. *A demolition company wishes to have a professional engineer verify the safety of a project activity. Give an example of good and bad practice and what ethical, legal and professional standards are in play and their consequences? (1,500 words)*

- b. *Describe an actual or perceived event where a Conflict of Interest or a significant risk of such may exist? (1,500 words)*

### **Module 13: Revision and Review**

The class will be assembled to review all previous modules and exercises, to discuss issues arising and to give opinions on learning, skills and continuous professional development.